

## CLAIMS

What is claimed is:

- 1 1. A method to blend two images, the method comprising:
  - 2 loading a vector of keys into a vector register;
  - 3 converting the vector of keys into a first vector of blending factors for a first
  - 4 image and a second vector of blending factors for a second image
  - 5 using a plurality of look up tables in a vector look up unit; and
  - 6 computing an image attribute for a blended image using the blending factors.
  
- 1 2. A method as in claim 1 wherein the blending factors are one of:
  - 2 a) floating point numbers;
  - 3 b) fixed point numbers; and
  - 4 c) integers.
  
- 1 3. A method as in claim 1 wherein said converting comprises:
  - 2 generating a first vector of indices in a vector register by replicating a first
  - 3 subset of the vector of keys as a first subset of the first vector of
  - 4 indices for looking up first blending factors for the first image and
  - 5 replicating the first subset of the vector of keys as a second subset of
  - 6 the first vector of indices for looking up second blending factors for
  - 7 the second image; and

8           looking up simultaneously the first and second blending factors using the  
9           first vector of indices in the vector look up unit.

1     4.    A method as in claim 3 further comprising:  
2           storing the first blending factors into the first vector of blending factors and  
3           the second blending factors into the second vector of blending  
4           factors.

1     5.    A method as in claim 1 wherein said converting comprises:  
2           generating a first vector of indices in a vector register, one key in the vector  
3           of keys being replicated as a first plurality of indices in the first  
4           vector of indices for looking up respectively a plurality of bit  
5           segments of a first blending factor; and  
6           looking up simultaneously a first vector of blending factors comprising the  
7           first blending factor using the first vector of indices in the vector look  
8           up unit.

1     6.    A method to blend two images, the method comprising:  
2           loading a first vector of keys into a vector register;  
3           loading a second vector of keys into a vector register;  
4           converting the first vector of keys into a first vector of blending factors for a  
5           first image and the second vector of keys into a second vector of  
6           blending factors for a second image using a plurality of look up tables

7                   in a vector look up unit; and  
8                   computing an image attribute for a blended image using the blending factors.

1     7.    A method as in claim 6 wherein the blending factors are one of:  
2       a) floating point numbers;  
3       b) fixed point numbers; and  
4       c) integers.

1     8.    A method as in claim 6 wherein said converting comprises:  
2       generating a first vector of indices in a vector register by replicating a first  
3               subset of the first vector of keys as a first subset of the first vector of  
4               indices for looking up first blending factors for the first image and  
5               replicating a first subset of the second vector of keys as a second  
6               subset of the first vector of indices for looking up second blending  
7               factors for the second image; and  
8       looking up simultaneously the first and second blending factors using the  
9               first vector of indices in the vector look up unit.

1     9.    A method as in claim 8 further comprising:  
2       storing the first blending factors into the first vector of blending factors and  
3               the second blending factors into the second vector of blending  
4               factors.

- 1       10. A method as in claim 6 wherein said converting comprises:  
2                  generating a first vector of indices in a vector register, one key in the first  
3                  vector of keys being replicated as a first plurality of indices in the  
4                  first vector of indices for looking up respectively a plurality of bit  
5                  segments of a first blending factor; and  
6                  looking up simultaneously a first vector of blending factors comprising the  
7                  first blending factor using the first vector of indices in the vector look  
8                  up unit.
- 1       11. A machine readable media containing executable computer program  
2                  instructions which when executed by a digital processing system cause said  
3                  system to perform a method to blend two images, the method comprising:  
4                  loading a vector of keys into a vector register;  
5                  converting the vector of keys into a first vector of blending factors for a first  
6                  image and a second vector of blending factors for a second image  
7                  using a plurality of look up tables in a vector look up unit; and  
8                  computing an image attribute for a blended image using the blending factors.
- 1       12. A media as in claim 11 wherein the blending factors are one of:  
2                  a) floating point numbers;  
3                  b) fixed point numbers; and  
4                  c) integers.

- 1       13. A media as in claim 11 wherein said converting comprises:  
2           generating a first vector of indices in a vector register by replicating a first  
3           subset of the vector of keys as a first subset of the first vector of  
4           indices for looking up first blending factors for the first image and  
5           replicating the first subset of the vector of keys as a second subset of  
6           the first vector of indices for looking up second blending factors for  
7           the second image; and  
8           looking up simultaneously the first and second blending factors using the  
9           first vector of indices in the vector look up unit.
- 1       14. A media as in claim 13 wherein the method further comprises:  
2           storing the first blending factors into the first vector of blending factors and  
3           the second blending factors into the second vector of blending  
4           factors.
- 1       15. A media as in claim 11 wherein said converting comprises:  
2           generating a first vector of indices in a vector register, one key in the vector  
3           of keys being replicated as a first plurality of indices in the first  
4           vector of indices for looking up respectively a plurality of bit  
5           segments of a first blending factor; and  
6           looking up simultaneously a first vector of blending factors comprising the  
7           first blending factor using the first vector of indices in the vector look

8 up unit.

- 1    16. A machine readable media containing executable computer program
- 2        instructions which when executed by a digital processing system cause said
- 3        system to perform a method to blend two images, the method comprising:
- 4            loading a first vector of keys into a vector register;
- 5            loading a second vector of keys into a vector register;
- 6            converting the first vector of keys into a first vector of blending factors for a
- 7                first image and the second vector of keys into a second vector of
- 8                blending factors for a second image using a plurality of look up tables
- 9                in a vector look up unit; and
- 10              computing an image attribute for a blended image using the blending factors.
- 1    17. A media as in claim 16 wherein the blending factors are one of:
  - 2        a) floating point numbers;
  - 3        b) fixed point numbers; and
  - 4        c) integers.
- 1    18. A media as in claim 16 wherein said converting comprises:
  - 2        generating a first vector of indices in a vector register by replicating a first
  - 3            subset of the first vector of keys as a first subset of the first vector of
  - 4            indices for looking up first blending factors for the first image and
  - 5            replicating a first subset of the second vector of keys as a second

6                   subset of the first vector of indices for looking up second blending  
7                   factors for the second image; and  
8                   looking up simultaneously the first and second blending factors using the  
9                   first vector of indices in the vector look up unit.

1     19.   A media as in claim 18 wherein the method further comprises:  
2                   storing the first blending factors into the first vector of blending factors and  
3                   the second blending factors into the second vector of blending  
4                   factors.

1     20.   A media as in claim 16 wherein said converting comprises:  
2                   generating a first vector of indices in a vector register, one key in the first  
3                   vector of keys being replicated as a first plurality of indices in the  
4                   first vector of indices for looking up respectively a plurality of bit  
5                   segments of a first blending factor; and  
6                   looking up simultaneously a first vector of blending factors comprising the  
7                   first blending factor using the first vector of indices in the vector look  
8                   up unit.

1     21.   A processing system to blend two images, the system comprising:  
2                   means for loading a vector of keys into a vector register;  
3                   means for converting the vector of keys into a first vector of blending factors  
4                   for a first image and a second vector of blending factors for a second

5                   image using a plurality of look up tables in a vector look up unit; and  
6                   means for computing an image attribute for a blended image using the  
7                   blending factors.

1     22.   A processing system as in claim 21 wherein the blending factors are one of:  
2               a) floating point numbers;  
3               b) fixed point numbers; and  
4               c) integers.

1     23.   A processing system as in claim 21 wherein said means for converting  
2               comprises:  
3               means for generating a first vector of indices in a vector register by  
4               replicating a first subset of the vector of keys as a first subset of the  
5               first vector of indices for looking up first blending factors for the first  
6               image and replicating the first subset of the vector of keys as a second  
7               subset of the first vector of indices for looking up second blending  
8               factors for the second image; and  
9               means for looking up simultaneously the first and second blending factors  
10              using the first vector of indices in the vector look up unit.

1     24.   A processing system as in claim 23 further comprising:  
2               means for storing the first blending factors into the first vector of blending  
3               factors and the second blending factors into the second vector of

- 4 blending factors.
- 1 25. A processing system as in claim 21 wherein said means for converting  
2 comprises:  
3 means for generating a first vector of indices in a vector register, one key in  
4 the vector of keys being replicated as a first plurality of indices in the  
5 first vector of indices for looking up respectively a plurality of bit  
6 segments of a first blending factor; and  
7 means for looking up simultaneously a first vector of blending factors  
8 comprising the first blending factor using the first vector of indices in  
9 the vector look up unit.
- 1 26. A processing system to blend two images, the system comprising:  
2 means for loading a first vector of keys into a vector register;  
3 means for loading a second vector of keys into a vector register;  
4 means for converting the first vector of keys into a first vector of blending  
5 factors for a first image and the second vector of keys into a second  
6 vector of blending factors for a second image using a plurality of look  
7 up tables in a vector look up unit; and  
8 means for computing an image attribute for a blended image using the  
9 blending factors.
- 1 27. A processing system as in claim 26 wherein the blending factors are one of:

- 2           a) floating point numbers;  
3           b) fixed point numbers; and  
4           c) integers.

1       28. A processing system as in claim 26 wherein said means for converting  
2           comprises:  
3           means for generating a first vector of indices in a vector register by  
4           replicating a first subset of the first vector of keys as a first subset of  
5           the first vector of indices for looking up first blending factors for the  
6           first image and replicating a first subset of the second vector of keys  
7           as a second subset of the first vector of indices for looking up second  
8           blending factors for the second image; and  
9           means for looking up simultaneously the first and second blending factors  
10           using the first vector of indices in the vector look up unit.

1       29. A processing system as in claim 28 further comprising:  
2           means for storing the first blending factors into the first vector of blending  
3           factors and the second blending factors into the second vector of  
4           blending factors.

1       30. A processing system as in claim 26 wherein said means for converting  
2           comprises:  
3           means for generating a first vector of indices in a vector register, one key in

4                   the first vector of keys being replicated as a first plurality of indices  
5                   in the first vector of indices for looking up respectively a plurality of  
6                   bit segments of a first blending factor; and  
7                   means for looking up simultaneously a first vector of blending factors  
8                   comprising the first blending factor using the first vector of indices in  
9                   the vector look up unit.

1       31. A processing system to blend two images, the system comprising:  
2                   a vector register file comprising a plurality of vector registers;  
3                   a vector processing unit coupled to the vector register file, the vector  
4                   processing unit comprising a vector look up unit adapted to look up a  
5                   vector of data items simultaneously, the vector processing unit:  
6                   loading a vector of keys into a vector register in the vector register file;  
7                   converting the vector of keys into a first vector of blending factors for a first  
8                   image and a second vector of blending factors for a second image  
9                   using a plurality of look up tables in the vector look up unit; and  
10                  computing an image attribute for a blended image using the blending factors.

1       32. A processing system as in claim 31 wherein the blending factors are one of:  
2                  a) floating point numbers;  
3                  b) fixed point numbers; and  
4                  c) integers.

1       33. A processing system as in claim 31 wherein to convert the vector of keys the  
2                  vector processing unit:

3                  generates a first vector of indices in a vector register in the vector register  
4                  file by replicating a first subset of the vector of keys as a first subset  
5                  of the first vector of indices for looking up first blending factors for  
6                  the first image and replicating the first subset of the vector of keys as  
7                  a second subset of the first vector of indices for looking up second  
8                  blending factors for the second image; and  
9                  looks up simultaneously the first and second blending factors using the first  
10                 vector of indices in the vector look up unit.

1       34. A processing system as in claim 33 wherein the vector processing unit stores  
2                  the first blending factors into the first vector of blending factors in a first  
3                  vector register in the vector register file and the second blending factors into  
4                  the second vector of blending factors in a second vector register in the vector  
5                  register file.

1       35. A processing system as in claim 31 wherein to convert the vector of keys the  
2                  vector processing unit:  
3                  generates a first vector of indices in a vector register in the vector register  
4                  file, one key in the vector of keys being replicated as a first plurality  
5                  of indices in the first vector of indices for looking up respectively a

6                   plurality of bit segments of a first blending factor; and  
7                 looks up simultaneously a first vector of blending factors comprising the first  
8                 blending factor using the first vector of indices in the vector look up  
9                 unit.

1     36. A processing system to blend two images, the system comprising:  
2                 a vector register file comprising a plurality of vector registers;  
3                 a vector processing unit coupled to the vector register file, the vector  
4                 processing unit comprising a vector look up unit adapted to look up a  
5                 vector of data items simultaneously, the vector processing unit:  
6                 loading a first vector of keys into a vector register in the vector register file;  
7                 loading a second vector of keys into a vector register in the vector register  
8                 file;  
9                 converting the first vector of keys into a first vector of blending factors for a  
10                 first image and the second vector of keys into a second vector of  
11                 blending factors for a second image using a plurality of look up tables  
12                 in the vector look up unit; and  
13                 computing an image attribute for a blended image using the blending factors.

1     37. A processing system as in claim 36 wherein the blending factors are one of:  
2                 a) floating point numbers;  
3                 b) fixed point numbers; and  
4                 c) integers.



1 40. A processing system as in claim 36 wherein to convert the vector of keys the  
2 vector processing unit:  
3 generates a first vector of indices in a vector register in the vector register  
4 file, one key in the first vector of keys being replicated as a first  
5 plurality of indices in the first vector of indices for looking up  
6 respectively a plurality of bit segments of a first blending factor; and  
7 looks up simultaneously a first vector of blending factors comprising the first  
8 blending factor using the first vector of indices in the vector look up  
9 unit.